

What is claimed is:

1. A prosthetic medical device comprising an SCF fiber bound within an implantable structure.

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2. The prosthetic medical article of claim 1 wherein the SCF fiber has a dimension from about 4 denier to about 8 denier.

10 3. The prosthetic medical article of claim 1 wherein the SCF fiber has a surface area at least a factor of 1.5 greater than a round fiber with the same diameter.

4. The prosthetic medical article of claim 1 wherein the SCF fiber has a surface area from a factor of 2.5 to a factor of 2.8 greater than a round fiber with the same diameter.

15 5. The prosthetic medical article of claim 1 wherein the SCF fiber comprises polyethylene, polypropylene, polyamide, a cellulose-based polymer, polyester, copolymers thereof or mixtures thereof.

20 6. The prosthetic medical article of claim 1 wherein the medical article is configured for implantation within the cardiovascular system of a human patient.

7. The prosthetic medical article of claim 1 wherein the device comprises a vascular closure device.

25 8. The prosthetic medical article of claim 1 wherein the device comprises an embolism protection device that has a configuration to filter flow through a vessel.

9. The prosthetic medical article of claim 1 further comprising a bioactive agent within surface capillaries of the fiber.

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10. The prosthetic medical article of claim 9 wherein the bioactive agent is selected from the group consisting of a thrombolytic agent, an anti-platelet agent, an anti-coagulation agent, a growth factor or a combination thereof.

5 11. The prosthetic medical article of claim 9 wherein the bioactive agent comprises a thrombolytic agent.

12. The prosthetic medical article of claim 9 wherein the bioactive agent comprises tPA.

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13. The prosthetic medical device of claim 1 further comprising a non-fibrous polymer substrate bound with the SCF fibers.

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14. The prosthetic medical device of claim 1 further comprising a medical adhesive associated with the SCF fiber.

15. The prosthetic medical device of claim 1 further comprising viable cells associated with the SCF fiber.

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16. The prosthetic medical device of claim 1 further comprising additional SCF fibers wherein the SCF fibers are in a fiber matrix.

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17. The prosthetic medical device of claim 16 further comprising a substrate on which the fiber matrix is located and a medical adhesive associated with the SCF fibers in a configuration to affix the substrate on a patient's tissue.

18. The prosthetic medical device of claim 17 wherein the substrate comprises a biocompatible polymer.

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19. The prosthetic medical device of claim 17 wherein the substrate comprises tissue.

20. A medical device comprising an SCF fiber and a quantity of bioactive agent associated with the SCF fiber.
 21. The medical device of claim 20 wherein the bioactive agent is selected from a 5 group consisting of an anti-microbial agent, a thrombolytic agent, an anti-platelet agent, an anti-coagulation agent, a growth factor or a combination thereof.
 22. The medical device of claim 20 wherein the bioactive agent comprises a thrombolytic agent.
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23. The medical device of claim 20 wherein the bioactive agent comprises tPA.
 24. The medical article of claim 20 wherein the bioactive agent comprises an anti-microbial agent.
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25. The medical device of claim 20 wherein the SCF fiber has a surface area of at least about a factor of 1.5 greater than a corresponding circular fiber with an equivalent diameter.
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26. The medical device of claim 20 wherein the device is configured for placement within a blood vessel without blocking flow through the vessel.
 27. The medical device of claim 20 wherein the device comprises a catheter and wherein the SCF fibers are associated with the inner surface of the catheter.
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28. A tubular medical device comprising a tubular substrate having an interior surface and an exterior surface and at least one SCF fiber associated with at least a portion of one of the surfaces.
 29. The tubular medical device of claim 28 wherein the device comprises a catheter configured for placement within a vessel of a patient.

30. The tubular medical device of claim 29 wherein the catheter is a microcatheter.
31. The tubular medical device of claim 28 wherein the SCF fibers are associated
5 with a bioactive agent.
32. The tubular medical device of claim 31 wherein the bioactive agent comprises heparin sulfate.
- 10 33. The tubular medical device of claim 28 wherein the at least one SCF fiber is associated with at least a portion of the inner surface.
34. A medical device comprising a non-porous surface at least a portion of which is covered with SCF fibers.
15 35. The medical device of claim 34 wherein the non-porous surface comprises a polymer.
36. The medical device of claim 34 wherein the surface is contoured to match a
20 portion of a structure within a patient.
37. The medical device of claim 34 wherein the SCF fibers are associated with a bioactive agent.
- 25 38. An artificial organ comprising SCF fibers and viable cell within a monolithic structure.
39. The artificial organ of claim 38 wherein the viable cells comprise liver cells and wherein the cells are within capillary channels along the fiber surface.
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40. The artificial organ of claim 38 wherein the viable cells comprise heart cells and wherein the SCF fibers are configured to deliver blood in the vicinity of the heart cells with blood flow along capillary channels of the SCF fibers.
- 5 41. The artificial organ of claim 38 further comprising tissue.
42. The artificial organ of claim 38 further comprising a polymer material forming a cavity and wherein the viable cell are located within the cavity.
- 10 43. The artificial organ of claim 38 wherein the SCF fibers have a shape factor from about 2.5 to about 2.8.
44. An aneurysm repair matrix comprising a mesh formed with an SCF fiber configured to envelope an aneurysm.
- 15 45. The aneurysm repair matrix of claim 44 wherein the SCF fiber is associated with pro-thrombotic drug.
46. The aneurysm repair matrix of claim 44 wherein the pro-thrombotic drug is formulated to be released gradually into the neighboring tissue.
- 20 47. A method for delivering a bioactive agent, the method comprising contacting a patient's body fluids/tissues with an SCF fiber associated with the bioactive agent.
- 25 48. The method of claim 47 wherein contacting of the patient's fluids/tissue comprises implanting a prosthetic device comprising the SCF fiber.
49. The method of claim 47 wherein contacting of the patient's fluids/tissue comprises delivery of the SCF fiber through a catheter.

50. The method of claim 49 wherein the SCF fiber is associated with the interior lumen of the catheter.

51. The method of claim 49 wherein the SCF fiber is associated with a medical device
5 that is delivered through the catheter.

52. The method of claim 47 wherein the bioactive agent is selected from the group consisting of a thrombolytic agent, an anti-platelet agent, an anti-coagulation agent, a growth factor or a combination thereof.